REMARKS/ARGUMENTS

In response to the final Office Action dated January 12, 2006, Applicants have amended the claims, which when considered with the following remarks, is deemed to place the present claims in condition for allowance. Favorable consideration of all pending claims is respectfully requested.

Claims 103-105 have been objected to under 37 C.F.R. §1.75 as allegedly a substantial duplicate of claims 106-108, respectively. By this amendment, claims 103-105 have been canceled, rendering moot the objection to these claims.

Claims 2-4, 7-17, 25, 28-44, 46-47, 49-50, 52-53, 79-81, 86-87, 90-92, 95-101, 103-121 and 138 have been rejected under 35 U.S.C. §112, first paragraph, as allegedly violative of the written description requirement. In response to this rejection, and in order to advance prosecution of this application, the language "with the proviso that an isolated nucleic acid molecule encoding a cytokinin oxidase from corn (maize) is not included" has been deleted from claims 2 and 3. Withdrawal of the rejection of claims 2-4, 7-17, 25, 28-44, 46-47, 49-50, 52-53, 79-81, 86-87, 90-92, 95-101, 103-121 and 138 under the written description provision of 35 U.S.C. §112, first paragraph, is therefore respectfully requested.

Claims 2-4, 7-17, 25, 28-44, 46-47, 49-50, 52-53, 79-81, 86-87, 90-92, 95-101, 103-121 and 138 have also been rejected as allegedly violative of the written description provision of 35 U.S.C. §112, first paragraph. In response to the rejection, claim 2, element (a) has been amended to recite "the DNA sequence" rather than "a DNA sequence." In claims 2 and 3, element (b) has been amended to recite "RNA sequence encoding the amino acid sequence set forth in SEQ ID NO:4." Element (c) of claims 2

and 3 has been deleted. Thus, as presently amended, claims 2 and 3 and claims dependent therefrom, are directed to nucleic acid molecules encoding the cytokinin oxidase having the amino acid sequence set forth in SEQ ID NO:4, or a complement thereof. Withdrawal of the rejection of claims 2-4, 7-17, 25, 28-44, 46-47, 49-50, 52-53, 79-81, 86-87, 90-92, 95-101, 103-121 and 138 under the written description provision of 35 U.S.C. §112, first paragraph is therefore respectfully requested.

Claims 2-4, 7-17, 25, 28-44, 46-47, 49-50, 52-53, 79-81, 86-87, 90-92, 95-101, 103-121 and 138 have been rejected under 35 U.S.C. §112, first paragraph, as allegedly directed to non-enabled subject matter. It is the position of the Examiner that the specification is enabling for: methods of stimulating root growth, enhancing lateral or adventitious root formation, increasing root size, the production of a transgenic plant and delaying the onset to flowering via transformation of a plant with a nucleic acid molecule comprising SEQ ID NO:26 encoding the polypeptide comprising SEQ ID NO:4, vectors and compositions comprising said nucleic acid molecule, and isolated host cell, plant, plant cell or plant tissue transformed therewith. According to the Examiner, however, methods for effecting the expression of a polypeptide, increasing the size of the root meristem, altering leaf senescence, increasing leaf thickness, decreasing vessel size, improving standability, increasing branching, improving lodging resistance, increasing seed size or weight, increasing embryo size or weight, increasing cotyledon size, increasing yield, increasing growth of seedling or an increase in early vigor, or increasing stress tolerance comprising expression of any of the nucleic acid molecules of claim 3 or 4 or a nucleic acid molecule as defined in claim 2 are not reasonably enabled by the specification. Further, according to the Examiner, the specification is also not enabling

for methods for stimulating root growth, enhancing lateral or adventitious root formation, increasing root size, the production of a transgenic plant and delaying the onset to flowering comprising expression of a nucleic acid molecule of claim 3 or 4 or a nucleic acid molecule as defined in claim 2 with the exception of SEQ ID NO:26 encoding SEQ ID NO:4.

In addition to amendment of the claims as discussed *supra*, Applicants respectfully submit that the following documentation provides further support for the claimed methods of: effecting the expression of a polypeptide, increasing the size of the root meristem, altering leaf senescence, increasing leaf thickness, decreasing vessel size, improving standability, increasing branching, improving lodging resistance, increasing seed size or weight, increasing embryo size or weight, increasing cotyledon size, increasing yield, increasing growth of seedling or an increase in early vigor, or increasing stress tolerance, stimulating root growth, enhancing lateral or adventitious root formation, increasing root size, the production of a transgenic plant and delaying the onset to flowering. The phenotype of increased size of the root meristem in a CKX2 transformed plant is described in Werner et al. (2001) "Regulation of Plant Growth by Cytokinin" *Proc. Natl. Acad. Sci. 98*(18): 10487-10494, provided herewith as Exhibit A. *See* page 10490, left column, last sentence to right column, line 2. The phenotype of altered leaf senescence in a CKX2 transformed plant is described in the specification at page 33, lines 20-23, page 111, lines 10-20 (observations including CKX2), Example 4, page 101, lines 15-19, Example 12, page 117, lines 12-13 and lines 25-27; Werner et al. (2001), page 10489, right column, lines 1-4; Werner et al. (2003) "Cytokinin-Deficient Transgenic Arabidopsis Plants Show Multiple Developmental Alterations Indicating Opposite

Functions of Cytokinins in the Regulation of Shoot and Root Meristem Activity" *The Plant Cell 15*:2532-2550, provided herewith as Exhibit B, *see especially* page 3535, left column, last sentence to right column, line 2 (observations including CKX2).

Further support for the phenotype of increased leaf thickness in CKX2 transformed plant is provided by Werner et al. (2001), page 10490, left column, last full paragraph, especially lines 13-14.

Further support for the phenotype of decreased vessel size is provided by Werner et al. (2001), *see especially* page 10490, left column, last full paragraph, in particular lines 13-14 of this paragraph.

Further support for the phenotypes of improved seedling standability, improved lodging resistance, increased growth of seedlings or increased early vigor in CKX2 transformed plants may be found in the specification, Example 4, page 102, line 15 to page 104, line 15; page 106, lines 1-22; Examples 9 and 16. Applicants respectfully submit that the terms "early vigor", "resistance to lodging" or "standability" all relate to the capacity to generate a well developed root system. *See* specification, page 82, lines 19-27. Early vigor is also linked to increased seed size (*see* specification page 26, lines 23 to page 27, line 4). Further support for these phenotypes may be found in Werner et al. (2001), page 10489, right column, last sentence to page 10490, line 4 and Figure 3B; and Werner et al. (2003), page 2537, left column, last full paragraph, line 1, to page 2538, line 12, and Figure 6G (seed size).

Support for the phenotype of increased branching in a CKX2 transformed plant may be found in the specification, Example 4, page 101, lines 15-19 (shoot branching) and lines 18-20 (root branching), page 106, lines 15-20 (root branching), Example 9,

page 113, items E and F (root branching). The phenotypes of increased seed size or weight, increased embryo size or weight, and increased cotyledon size may be found in the specification, example 16, and is also further supported by Werner et al. (2003), *see* Figure 6G. Further with respect to seed yield data, the data given in Examples 3 and 4 are not representative of the invention. On page 105, lines 5-7, the specification discloses "please note that these plants were grown under green house conditions during winter time. This affects negatively the number of flowers that are formed, in particular in the transgenic clones." The data presented in Example 16 of the present application as well as data presented in pending U.S. Patent Application Serial No.10/871,304 (Example 17), are consistent and clearly demonstrate increased seed yield in CKX2 transformed plants. Moreover, Applicants have submitted data previously as Exhibit E (corresponding to Example 17 in U.S. Serial No. 10/498,168) in the amendment dated August 30, 2004, further supporting increased seed yield in CKX2 transformed plants.

The phenotype of increased yield in a CKX2 transformed plant is described in the specification at Example 16 (data for increased seed yield), Example 4, page 102, line 15 to page 104, line 15, page 106, lines 1-22 (increased root growth); Example 12, page 117, lines 6-13 (no negative effect on shoot growth). Further support may be found in Werner et al. (2001); page 10489, last sentence to page 10490, line 6.

Support for the phenotype of increased stress tolerance may be found in the specification, page 25, lines 17-21 (link to early vigor; *see supra*, page 23, for a description of early vigor), page 27, lines 1-2.

Claims 28-29 are allegedly non-enabled because the recitation "effecting the expression" reads on methods not disclosed by Applicants. As presently amended,

claims 28-29 recite in relevant part: "A method for expressing a polypeptide comprising the amino acid sequence set forth in SEQ ID NO:4..." Support for a method for expressing a polypeptide comprising SEQ ID NO:4 may be found in the present application at Example 4, items 1-3, and pages 100 to 107 of the specification. In view of the amendments to the claims and the foregoing remarks, withdrawal of the rejection of claims 2-4, 7-17, 25, 28-44, 46-47, 49-50, 52-53, 79-81, 86-87, 90-92, 95-101, 103-121 and 138 under 35 U.S.C. 112, first paragraph, as allegedly non-enabled is respectfully requested.

Claims 10-15 and 17 have been rejected under 35 U.S.C.§101 as allegedly directed to non-statutory subject matter. As presently amended, claims 10-17 recite in relevant part "isolated host cell". Withdrawal of the rejection of claims 10-15 and 17 under 35 U.S.C. §101 is therefore respectfully requested.

Claim 100 has been rejected under 35 U.S.C. § 101 as allegedly directed to non-statutory subject matter. As presently amended, claim 100 recites: "A harvestable part of a plant of claim 98 or 99 wherein the harvestable part comprises the nucleic acid molecule which was introduced into the transgenic plant." Withdrawal of the rejection of claim100 is therefore respectfully requested.

Claims 2-4, 7-17, 25, 28-44, 49-50, 52-53, 79-81, 86-87, 90-92, 95-101, 103-121 and 138 remain rejected under 35 U.S.C. §102(b) as allegedly anticipated by Morris (February, 1999, WO 99/06571). As currently amended, claims 2 and 3 no longer recite in relevant part: "an isolated nucleic acid molecule specifically hybridizing to SEQ ID NO: 26, or to the complement thereof under medium stringency conditions such as 1-4X SSC/0.25 % w/v SDS at 45° C or higher for 2 -3 hours, with the proviso that an isolated

nucleic acid molecule encoding a cytokinin oxidase from corn (maize) is not included." As presently amended therefore, the rejected claims no longer encompass the cytokinin oxidase taught by Morris, and withdrawal of the rejection of claims 1-4, 7-17, 25, 28-44, 49-50, 52-53, 87, 98-101, and 138 under 35 U.S.C.§ 102(b) is respectfully requsted.

Claims 3-4, 7, 10-11 and 14-15 have been rejected under 35 U.S.C.§ 102(b) as allegedly anticipated by Lin et al. (January 1999, NCBI Accession Number AC005917). Lin et al. (January 1999) has been cited for disclosing a nucleic acid molecule encoding a protein as defined in SEQ ID NO:4 wherein the nucleic acid molecule is taught in Genbank accession number: AC005917. It is the position of the Examiner that the sequence of Lin encodes SEQ ID NO:4 and that the mis-coding of Alanine 230 and Lysine 405 is due to sequencing errors which are known to occur in DNA sequencing reactions.

In the first instance, Applicants correct the record with respect to the Examiner's statement that the sequence of Lin et al. encodes SEQ ID NO:4 and that the mis-coding of Alanine 230 and Lysine 405 is due to sequencing errors which are known to occur in DNA sequencing reactions. Applicants direct the Examiner to Example 2B of the present application which supports the notion that the *Arabidopsis thaliana* CKX2 cDNA/protein sequence was wrongly predicted by Lin et al. 1999 due to the different prediction of splice sites. Bilyeu et al. published the correct cDNA sequence of Arabidopsis CKX2 on Nov. 8, 2000 (cDNA locus AF303978). This was corrected for the first time in the public database annotations mentioned above in the 2002 version. Thus, as of the priority date of the present application, Lin et al. (1999) did not teach a nucleic acid molecule encoding a protein having the amino acid sequence of Applicants' SEQ ID NO:4.

Further in response to the rejection, Applicants submit that the claims have been amended so that the hybridization language has been deleted; recite "the DNA sequence" rather than "a DNA sequence", recite "RNA sequence encoding the amino acid sequence of SEQ ID NO:4" rather than "RNA sequence corresponding to SEQ ID NO:26", and no longer recite "functional fragment" or "immunologically active fragment." Claim 3, element (a) has been amended to recite: "an isolated nucleic acid molecule comprising the contiguous DNA sequence as set forth in SEQ ID NO:26 or the complement thereof."

Applicants respectfully submit the following. Lin et al. teach a genomic DNA having the nucleotide sequence set forth in SEQ ID NO: 37. Although parts of SEQ ID NO:26 may be found in the nucleotide sequence disclosed by Lin et al., the contiguous sequence of SEQ ID NO:26 is not found in SEQ ID NO:37. In contrast, the presently claimed invention is directed to an isolated nucleic acid molecule comprising the contiguous DNA sequence set forth SEQ ID NO:26. The presently claimed invention is also directed to a nucleic acid molecule encoding the protein of SEQ ID NO:4 or the complement thereof, provided that the nucleic acid molecule is not the nucleic acid molecule as deposited under Genbank accession number AC005917 (SEQ ID NO:37). Thus, the presently claimed invention is distinguished from the teaching of Lin et al. and withdrawal of the rejection of claims 3-4, 7, 10-11 and 14-15 under 35 U.S.C.§ 102(b) is therefore warranted.

Claims 3-4, 7-17, 25 and 30-42 have been rejected under 35 U.S.C.§ 103(a) as allegedly unpatentable over Lin et al. It is the position of the Examiner that "given the teachings of Lin et al of a nucleic acid molecule encoding a protein having cytokin oxidase activity, it would have been obvious to one of ordinary skill in the art to isolate or

make another nucleic acid molecule encoding a protein as defined in SEQ ID NO:4. It would have been further obvious to construct a vector comprising said nucleic acid molecule operably linked to a regulatory element operable in plants, and the transform a plant with said vector."

Applicants respectfully traverse the rejection for the following reasons. Nowhere in Lin et al. is the amino acid sequence for SEQ ID NO:4 taught or suggested. The disclosure of a cytokin oxidase having the amino acid sequence set forth in SEQ ID NO:4 *first appears in the present application*. Therefore, as of the priority date of the present application, without having the specification of the present application in hand, a nucleic acid molecule encoding the amino acid sequence set forth in SEQ ID NO:4 would not have been obvious to one skilled in the art. Nor would it have been obvious to make a vector comprising a nucleic acid molecule encoding the protein of SEQ ID NO:4 operably linked to a regulatory element allowing expression in a plant or a transgenic plant or harvestable part comprising the nucleic acid sequence encoding the protein of SEQ ID NO:4 and a regulatory element.

A proper obviousness rejection requires that the suggestion to carry out the claimed invention must be found in the prior art, *not in Applicant's disclosure. In re Vaeck,* 947 F.2D 488, 492, 20 USPQ, 1438, 1442 (Fed. Cir. 1991). Because the Examiner is basing the obviousness rejection on Applicants' disclosure, the rejection is improper and withdrawal of the rejection of claims 3-4, 7-17, 25 and 30-42 under 35 U.S.C.§ 103(a) is therefore warranted.

In view of the foregoing remarks and amendments, it is respectfully submitted

that the present case is in condition for allowance, which action is earnestly solicited.

Respectfully submitted

Ann R. Pokalsky
Registration No.: 34,697

Dilworth & Barrese, LLP
Attorney for Applicants
333 Earle Ovington Boulevard
Uniondale, New York 11553
Tel. No. (516) 228-8484
Fax No. (516) 228-8516

ARP/ml